INTRODUCTION

Aesthetic appearance is the key factor in interrelationships between human beings and their socio-psychological developments. Orthognathic surgery has been the main objective of correcting skeletal discrepancies as well as altering facial balance, to achieve the aesthetic results in patients who have severe disharmony of the jaws. There are two common surgical line of treatment for Class II malocclusion with hyperdivergent mandible, first was surgical vertical maxillary impaction and mandibular advancement with genioplasty and second approach through maxillary impaction and setback of maxilla by means of Lefort I osteotomy and augmentation genioplasty as a camouflage procedure. Counter-clockwise rotation of mandible is the conservative method to reduce a surgical procedure. But there is a misconception developed that the Counter-clockwise rotation of the occlusal plane is an unstable procedure, further stated in the literature that one should randomly alter the occlusal plane angle based on their clinical impression to emphasize that this is the simplest method of correcting the existing functional and aesthetic relationship of class II malocclusion with hyperdivergent mandible. In additional to, there should be a standardized measurement protocol for mandibular stability and evaluation of amount of rotation. Hence in this study, evaluation of

facial aesthetic for Class II hyperdivergent mandible, by altering the high Mandibular plane angle into an orthognathic mandibular plane angle by Counter-clockwise (CCW) rotation of mandible.

1.1 Background of the study

The present study aimed mainly to assess the post-surgical evaluation of facial aesthetic and functional stability for Class II hyperdivergent mandible by Counter-clockwise (CCW) rotation of mandible.

1.2 Significance of the study

To determine the facial aesthetics and functional stability by doing single jaw surgery, on counter-clockwise advancement and rotation of mandible.

1.3 Need for the study

Necessity of this study to avoid Bi-jaw surgery into Single jaw surgery within the limit of the inclusion criteria and thereby reducing a surgical procedure and achieving better facial profile.

1.4 Statement of the problem

Hyperdivergent skeletal class II malocclusion denotes with anterior open bite and short ramal length resulting in malocclusion, difficulty in breathing, phonetics and unaesthetic facial appearance.

1.5 Objectives of the study

1. Change in occlusion from class II to class I,
2. Increase in posterior facial height.
3. Decrease in anterior facial height (Go-Gn which implies the CCW movement of the mandible has reduced anterior open bite).
4. Post-surgical accelerated orthodontics for skeletal stability.

1.6 Null Hypothesis

There is no difference in the treatment outcomes between modified Mandibular advancement and Conventional mandibular advancement in class II skeletal deformity patients.

1.7 Operational Definition

For all patients, the pre surgical orthodontics and composite analysis and splint fabrication was carried out by model surgery with Erikson's platform. During surgical phase, when Bilateral Sagittal Split Osteotomy (BSSO) performed, the vertical surgical cut is given distal to first molar and mesial to second molar which act as a fulcrum for CCW rotation. Once BSSO osteotomy cuts performed, the prefabricated splint was placed on the preplanned positions and intermaxillary stabilizations were carried out. The bony segments were fixed in condylar resting position, using single 4-hole plate with

gap (KLS MARTIN, Tuttlingen, Germany) on the external oblique ridge. Then semi rigid skeletal fixation is completed followed by the release of intermaxillary fixation. The position of the condyles and desired occlusion position checked. In the immediate postoperative period posterior bite was maintained in 4mm open bite using Trasbond Plus from 3M (South Peck Road, Monrovia, CA 91016 USA) till the accelerated orthodontic movements are started. Finally, Post – orthodontic procedure was completed.

1.8 Assumption

Improving Facial aesthetics and stability by increasing the posterior facial height and decreasing anterior facial height in single jaw surgery within the limits of facial divergence, to achieve orthognathic plane angle.

1.9 Delimitations

Ten patients registered with department of Oral and Maxillofacial Surgery, Karpaga Vinayaga institute of Dental sciences with Class II Hyperdivergent malocclusion with hyperdivergent mandible were selected.

REVIEW OF LITERATURE

General concepts

Kim et al. assessed quantify the soft tissue changes after orthognathic surgery, as well as the differences in 3D soft tissue changes in the middle and lower third of the face between the 1- and 2-jaw surgery groups, in mandibular prognathism patients. **T**hey concluded that overall soft tissue changes of the midfacial area were more evident in the 2-jaw surgery group. In 2-jaw surgery, significant changes would be expected in the midfacial area, but caution should be exercised in patients who have a wide alar base.

Alissa Maria Varella et al. evaluated the function, psychology, and aesthetics of severe Skeletal Hyperdivergent Class II Malocclusion through orthodontic-surgical approach through superior repositioning (Vertical maxillary impaction) using Le-Fort I osteotomy, mandibular advancement, and genioplasty. Finally concluded that multidisciplinary approach in the successful management of a patient with VME and mandibular advancement to achieve superior function, stability, facial aesthetics, and an ideal occlusion.

Nayeemullah Khan et al. Skeletal Class II malocclusions with vertical maxillary excess (VME) present with an amalgamation of several problems pertaining to psychological, esthetics, and function.

The optimal treatment plan in such cases includes a synchronized orthodontic-surgical approach through superior repositioning and setback of maxilla by means of Le Fort I osteotomy and augmentation genioplasty. This case report describes a multidisciplinary approach in the successful management of a patient with VME to achieve superior esthetics and function.

Bruce N. Epker reported that this is an interesting concept that counterclockwise advancement of mandible is a misinterpretation of the literature. Indeed, the notion that one should randomly alter the occlusal plane angle on the basis of their clinical impression without foundation. Despite the improvements in, and the increased complexity of the procedures that we can perform, I would like to emphasize that the simplest method ofcorrecting the existing functional and esthetic relationship is still the best method.

M Burke and A Jacobson. Studied the Vertical changes in high-angle Class II, division 1 patients treated with cervical or occipital pull headgear and concluded that regarding vertical changes, only maxillary molar height, relative to both sella-nasion and palatal plane, and occlusal plane angle changes were significantly different when cervical and occipital-pull headgear were compared.

METHODOLOGY

Twenty patients aged between 19-26 years of age were selected in this research study with skeletal class II hyperdivergent mandible. Patients were informed briefly about the procedure and consent was obtained. Cephalograms of patients with high mandibular plane angle and high lower gonial angle were Selected. One maxillofacial surgeon with the orthodontist was involved in the entire treatment and the cephalometric tracing was carried out by a single operator.

3.1 Research Approach

A prospective clinical study for patients requiring correction of class II hyperdivergent mandible are registered with the department of Oral and Maxillofacial Surgery at Karpaga Vinayaga Institute of Dental Sciences, Kanchipuram were selected. Patients were informed briefly about the procedure and consent to participate in this study was also obtained from the study participants. A proper history followed by pre-operative and post-operative assessment, including clinical and radiological examinations was done.

3.2 Research Design

Twenty patients selected for this study purpose. These patients divided into Group I- and research Group- II containing ten patients

in each group. Pre-operative, intra operative and post-operative clinical, radiological composite analysis measurement outcomes were analysed. Immediate and delayed facial profiles and skeletal stability measured.

3.3 Variables - Dependent variable

1. High mandibular plane angle (SN- GoGn 33^0 to 37^0)
2. High lower gonial angle (GoGn - GoN $78^0 \pm 3^0$)
3. Counter-clockwise rotation of mandible with 4 mm of posterior open bite

3.4 Research Setting

The research was conducted on patients randomly selected with a diagnosis of class II hyperdivergent mandible among the population from Southern India.

3.5 Population of the study

A prospective random selection was undertaken to evaluate the facial aesthetic and functional stability for Class II hyperdivergent mandible by Counter-clockwise (CCW) rotation of mandible with posterior open bite, for patients with no contra-indication to general anaesthesia and ASA-I (no systemic disease), requiring surgical intervention.

3.6 Sample

20 patients meeting the inclusion criteria of the study were selected after registering with the department of Oral and Maxillofacial Surgery at Karpaga Vinayaga Instititute of Dental Sciences, Kanchipuram. Patients were divided into 10 for each group:

Group I (control group) – Conventional mandibular advancement of skeletal class II patients

Group II – Modified counter-clockwise Mandibular advancement of skeletal class II patients.

3.7 Sample Collection Criteria

A. Inclusion criteria

1. High mandibular plane angle (SN- GoGn 33^0 to 37^0)
2. High lower gonial angle (GoGn - GoN $78^0 \pm 3^0$)
3. Age: 19 – 26 years
4. Gender: Male and Female

B. Exclusion Criteria

1. Low mandibular plane angle
2. Vertical maxillary excess along with high plane angle
3. Syndromic patients

3.8 Sample Technique

The selected study population were based on stratified random probability sampling with patients diagnosed with Class II hyperdivergent mandible.

3.9 Process of Sample Collection

20 patients with Class II hyperdivergent mandible who were registered for orthognathic surgery with the Department of Oral and Maxillofacial Surgery, Karpaga Vinayaga Instititute of Dental Sciences, Kanchipuram were selected. The surgical planning and orthodontic procedure were done by a single qualified Oral and Maxillofacial Surgeon, orthodontist and single operator was involved in the cephalometric tracing.

3.10 Data Collection Instrument

1. Cephalometric tracing was repeated with a lag period of 4 weeks by the same operator.
2. Pre- and post-surgical facial typology evaluations were done with composite cephalometric analysis using cephalometric software (Delta-Dent, Outside Forma, Piollat, Italy).

3.11 Description of the Intervention

11 Essential linear and angular measurements that accurately interpret the facial aesthetics evaluation and improvement were analysed (composite analysis) in the following manner with the normal values.

MAXILLA:

a. SNA- The angle between anterior cranial base (SN) and the NA line.
b. ANS to PNS – The length of the maxilla.
c. U6-NF - Upper 1st Molar to Nasal floor.
d. U1-NF - Upper Incisors to Nasal floor.
e. N to PNS – Upper posterior facial height.

MANDIBLE:

a. Ar-Go – Mandibular ramus length.
b. Go-Pg – Mandibular body length.
c. L6-MP – Lower 1st molar to mandibular plane
d. L1-MP – Lower incisor to mandibular plane
e. SNB - The angle between the anterior cranial base (SN) and the NB line.

MAXILLO – MANDIBULAR COMPLEX

a. ANB - The angle between the NA and NB lines.
b. Gonial Angle - The angle between the Go-Gn line and the Go-Ar line.

c. Upper Gonial Angle - The angle between the Go-N line and the Go-Ar line.
d. Lower Gonial Angle - The angle between the Go-Gn line and the Go-N line.
e. SN-GoGn - The angle between SN and the Go-Gn line – Mandibular Plane Angle.
f. Lower Facial height - The angle between the ANSXi line and the PmXi line.
g. OP-SN - The angle between the cranial base (SN plane) and the occlusal plane.
h. OP-FH - The angle between the FH plane and the occlusal plane.
i. OP-GoGn - The angle between the mandibular plane (Go-Gn) and the occlusal plane.
j. ANS to Gn - Lower Anterior facial Height.
k. Anterior facial height – N-Me.
l. Posterior facial height – S- Go.

3.12 Content Validity

Assessed by recording the subjective and objective variables such as facial aesthetics, functional stability, malocclusion and phenetics among the study population were evaluated both pre- and post-operatively.

3.13 Reliability of the Tool

Reliability of the values were evaluated using T-Test, NPar test and Mann-Whitney Test statistical analysis among the study populations.

3.14 Ethical Consideration

1. A prior informed written consent was obtained from all the patients. Patient's anonymity and confidentiality will be maintained during the entire course of the study.
2. An institutional ethical clearance was obtained before undertaking the study formally.

3.15 Pilot Study

An internal pilot study was conducted among 5 patients reported to out-patient department of Oral and Maxillofacial Surgery, Karpaga Vinayaga Instititute of Dental Sciences, Kanchipuram diagnosed with Class II hyperdivergent mandible were included in the research profile of the main study population. The subjective and objective outcomes of the pilot study proved to be effective necessitating further larger study.

3.16 Data Collection Procedure

A total of 20 patients with Class II hyperdivergent mandible, who registered with the department of Oral and Maxillofacial Surgery, Karpaga Vinayaga Instititute of Dental Sciences, Kanchipuram were selected.

After documenting a proper case history and clinical examination, OPG and Lateral Cephalogram was obtained. The angulation of both mandibular plane angle and lower gonial angle was measured. Patients having angulations within the limit mentioned in the inclusion criteria were selected. The surgical procedure was performed by modified BSSO with CCW rotation of mandible with a posterior open bite of 4mm, with the aid of Trasbond Plus bite block which was placed pre-surgically.

Post-operatively, patients were assessed by a single qualified research assistant at periodic intervals clinically and radiographically.

3.17 Dropout Analysis

Dropout analysis of the patients was done using SPSS software using data missing method.

3.18 Follow- Up

The patients were followed up post-operatively for a period of two years clinically and radiographically to assess relapse.

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ANNEXURES

I: ETHICAL CLEARANCE FORM

II: CONSENT FORM

III: CASE HISTORY PERFORMA

IV: STUDY DATA SHEET FOR ASSEMENT OF OCCLUSAL PLANE ALTERATION

V: PAPER PUBLICATIONS

ANNEXURE – I

ETHICAL CLEARANCE

KARPAGA VINAYAGA INSTITUTE OF DENTAL SCIENCES
G.S.T. Road, Chinna Kolambakkam, Palayanoor (Po.)
Madhuranthagam (Tk.) Chengalpattu - 603 308.
Phone : 044-27598484

INSTITUTIONAL ETHICS COMMITTEE Date :.....

IEC-KIDS APPROVAL LETTER

IEC NO: KIDS/12/2018

Title of the study:

'Management Of Class II Hyper-Divergent Mandible By Surgically Altering Occulusal Plane Pattern Through Counter Clockwise Rotation of Mandible"

Investigator: **Dr. B. Balaguhan**
Professor,
Department of Oral &
Maxillofacial Surgery

Guide: **Dr.R.S. Neelakandan**
Principal& HOD
Meenakshiammal Dental college

The members of the Institutional Ethics Committee met on 22.03.2018(Thursday) at KIDS and reviewed the above named project with all the documents submitted. The Institutional Ethics Committee after careful deliberations, has granted final approval to the project. The above mentioned project/ study may now be undertaken at IEC- KIDS in accordance with the study protocol submitted by the investigators, subject to fulfilling local and other institutional regulations.

Date of Presentation : 22.03.2018

Date of IEC Approval : 30.03.2018
Modification post approval, if any :: -

Member Secretary
Institutional Ethics Committee
MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE
KARPAGAVINAYAGA INSTITUTE OF DENTAL SCIENCES

Chairman
Institutional Ethics Committee
CHAIRPERSON
INSTITUTIONAL ETHICS COMMITTEE
KARPAGAVINAYAGA INSTITUTE OF DENTAL SCIENCES

KARPAGA VINAYAGA INSTITUTE OF DENTAL SCIENCES * PALAYANOOR * KIDS

ANNEXURE – II

I, the undersigned …… …… age/sex……, resident of …… …… Here by give my voluntary consent without any pressure in my complete consciousness to undergo the treatment necessary as required for the study "**Management of Class II Hyperdivergent Mandible by Surgically Altering Occlusal Plane Pattern through Counter-clockwise Rotation of Mandible"** being conducted by **Dr. B. Bala guhan,** Department of oral and maxillofacial surgery, Karpaga Vinayaga Instititute of Dental Sciences, Kanchipuram. I have been explained about the treatment procedure and the benefits, associated with the same. I have been explained and understood the study protocol and I understand that this is a clinical research. I have also been explained that my identification will be kept confidential, and all the data collected will only be used for this research and academic purpose and not for commercial or any other activity. I agree to co-operative fully with the clinicians. I understand that I have the right to withdraw from study at any stage of the study.

Signature of patient

ANNEXURE – III

CASE HISTORY PERFORMA

Chief complaint:

Present Illness History:

Past Medical / Surgical History:

Heart Disease	Hypertension	DM DI	Renal Disease
Malignancy	Thyroid Disease	Liver Disease	Bleeding
Disorder	Seizure Disorder	HIV / HCV / HBV	

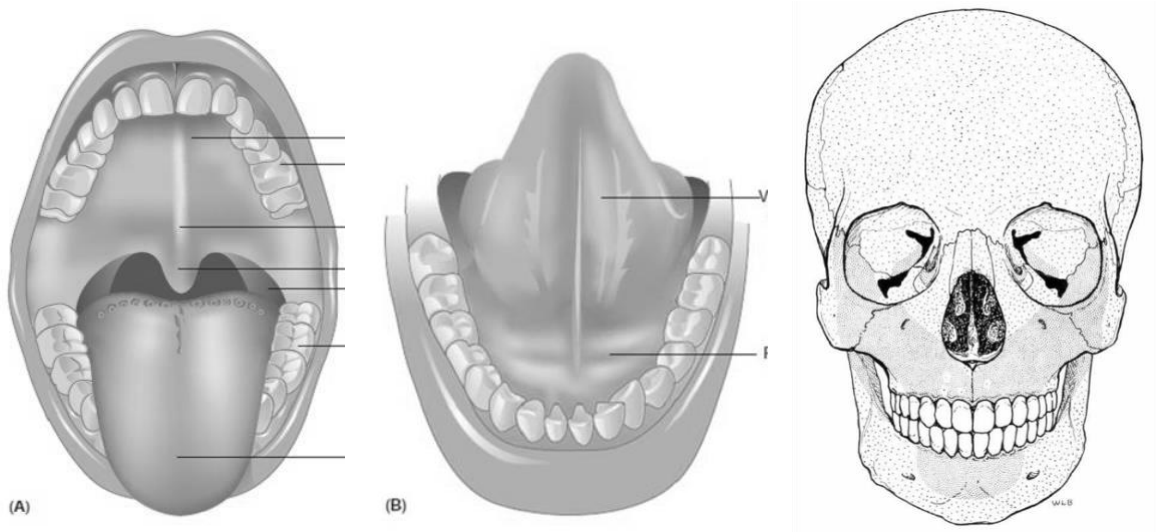
Home Medications:

Allergies:

Social History:

Local Examination - Soft Tissue:

- Hard Tissue:



FACIAL EXAMINATION

Facial symmetry (Site of asymmetry):

Orbits Malar Midface Mandible Chin Ear

Facial form:

Brachy Meso Dolicho

Profile:

Convex Concave Straight

Orbital:

Interpupillary distance _____ mm
Intercanthal distance _____ mm

Malar form :

Normal Deficient Prominent

Nasolabial fold:

Normal Deep Flat

Scleral Show: Y / N

NOSE

Alar base width: _____mm

Tip deviation: Right Left

Tip anatomy: Wide Narrow Droop Tension

Supratip break Y / N

Dorsal contour: Hump Concave Normal

Septal deviation: Right Left Perforation

Inferior Turbinates: Normal Large

LIP

Upper lip length: _____mm

Lip contour: Full Thin

Nasolabial angle: Acute Obtuse Normal

Incisor Show:

At rest _____mm

Smiling _____mm

Interlabial Gap _____mm

Gingival Show _____mm

CHIN

Labiomental fold: Deep Flat Normal

Mentalis strain: Yes No

Chin – Neck angle: _____ degrees

Soft Tissue pogonion to natural vertical: _____mm

DENTAL

Maxillary dental midline: ____ mm to facial axis

Mandibular dental midline: ____ mm to facial axis

Maxillary – Mandibular incisors: ____mm

Occlusal cant: Yes No

Rt pupil to canine ____mm

Lt pupil to canine ____mm

Overjet _____mm **Overbite**

_____mm

Arch form: Upper U V

Lower U V

Arch width:

Upper	Narrow	Wide	Normal
Lower	Narrow	Wide	Normal

Angle classification:

Rt	Molar I II III	Lt	Molar I II III
Rt	Canine I II III	Lt	Canine I II III

CR/CO discrepancy _____mm

Labs:

OPG	**Lat Ceph**	**AP Ceph**	**IOPA**
CT	**MRI**	**Photos**	

Diagnosis:

Treatment Plan:

ANNEXURE – IV

STUDY DATA SHEET ASSEMENT FOR OCCLUSAL PLANE ALTERATION AND FACIAL AESTHETIC IN THE BOTH GROUPS – PRE AND POST OPERATIVE

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
MAXILLA										
SNA (degree)										
ANS to PNS (mm)										
U6 to NF (mm)										
U1 to NF (mm)										
N to PNS (mm)										
MANDIBLE										
Ar – Go (mm)										
Go-Pg (mm)										
L6 to MP (mm)										
L1 to MP (mm)										
SNB (degree)										
MAXILLO-MANDIBULAR COMPLEX										
ANB (degree)										
Gonial angle (degree)										
Upper gonial angle (degree)										
Lower gonial angle (degree)										
SN – GoGn (degree)										
Lower Facial Height (degree)										
OP -SN (degree)										
OP-FH (degree)										
OP-GoGn (degree)										
ANS to Gn (mm)										
Anterior Facial Height(mm)										
Posterior Facial Heigh(mm)										
Jarabak's ratio (%)										

ANNEXURE - V

PAPER PUBLICATIONS

ORIGINAL RESEARCH

Management of Class II Hyperdivergent Mandible by Surgically Altering Occlusal Plane Pattern through Counterclockwise Rotation of Mandible

Balaguhan Balasubramanian[1], Neelakandan RS[2], Srinivasan Boovaraghavan[3], Raja S Gali[4], Sudhakar Venkatachalapathy[5], Kirthika Natarajan[6]

Abstract

Aim: To evaluate the facial esthetic of class II hyperdivergent mandible by altering the high mandibular plane angle into an orthognathic mandibular plane angle by counterclockwise (CCW) rotation of the mandible.

Materials and method: Five patients with class II hyperdivergent mandible were selected for this study. Initially, pre-orthodontics was done by aligning the teeth. Then, surgically, bilateral sagittal split osteotomy (BSSO) advancement with CCW rotation of mandible with a posterior open bite of 4 mm was done. Eleven linear and 11 angular measurements were taken. Pre- and postsurgical values were evaluated by composite cephalometric analysis, and the changes in the occlusal plane and facial height were statistically analyzed by using paired *t*-test. Jarabak ratio was calculated for facial height measurements. Further finishing will be done by postsurgical orthodontic procedures to get functional occlusion.

Results: Change in occlusion to class I is seen in values of Jarabak ratio and Go-Gn. Jarabak ratio shows an increase in posterior and decreases in anterior facial height. Go-Gn, which implies the CCW movement of the mandible, has reduced the anterior open bite and created a posterior open bite of 4 mm for the supraeruption of teeth.

Conclusion: BSSO with CCW rotation of mandible with a posterior open bite has conservatively involved in single-jaw surgery, thereby improving the facial esthetics of all the patients taken this study.

Clinical significance: This innovative method of CCW rotation of mandible with open bite mainly prevents the bi-jaw surgery, improves the stability, and gives an esthetically good appearance.

Keywords: BSSO, Class II hyperdivergent mandible, Counterclockwise rotation of mandible, Occlusal plane alteration.

The Journal of Contemporary Dental Practice (2021): 10.5005/jp-journals-10024-3146

Introduction

Facial appearance is the key factor in interrelationships between human beings and their socio-psychological developments. Therefore, orthognathic surgery has been the objective of correcting skeletal discrepancies as well as altering facial balance, to achieve the esthetic results in patients who have severe disharmony of the jaws.[1] The general surgical line of treatment for class II malocclusion with hyperdivergent mandible was surgical vertical maxillary impaction and mandibular advancement with genioplasty [bi-jaw surgery combining Le Fort I osteotomy to bring about the maxillary impaction and rotational bilateral sagittal split osteotomy (BSSO) for mandibular advancement combined with/without sliding genioplasty] for further profile enhancement.[2] Another approach was through Le Fort I osteotomy and augmentation genioplasty.[3]

As discussed by Bruce N Epker in 1993, there is a misconception developed that the counterclockwise (CCW) rotation of the occlusal plane is an unstable procedure; further, he stated that one should randomly alter the occlusal plane angle based on their clinical impression to emphasize that this is the simplest method of correcting the existing functional and esthetic relationship of class II malocclusion with hyperdivergent mandible.[4]

The case selection for class II hyperdivergent mandible was mainly done, based on the lateral cephalometric analysis of upper and lower gonial angle, ramus length, occlusal, and mandibular plane angle of each patient, who were within our parameters. This common deformity encountered by the maxillofacial surgeons

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How to cite this article: Balasubramanian B, Neelakandan RS, Boovaraghavan S, *et al.* Management of Class II Hyperdivergent Mandible by Surgically Altering Occlusal Plane Pattern through Counterclockwise Rotation of Mandible. J Contemp Dent Pract 2021;x(x):xx–xx.

Source of support: Nil

Conflict of interest: None

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CASE REPORT

Facial Asymmetry Due to Hemifacial Microsomia Managed by an Interdisciplinary Approach: A Case Report

Balaguhan Balasubramanian[1], Sudhakar Venkatachalapathy[2], Kirthika Natarajan[3], TS Vinodhini Sudhakar[4], Karthikeyan G Rathan[5], Mathan M Aiyathurai[6], Sivakumar Arumugam[7]

Abstract

Aim and objective: The aim of this case report is on an interdisciplinary orthodontic and surgical treatment approach of facial asymmetry due to congenital hemifacial microsomia (HFM).

Background: Hemifacial microsomia is the second common congenital craniofacial deformity after cleft lip and palate, which presents with different clinical characteristics, including an extremely variable asymmetrical presentation. And there is no standardized treatment protocol for this type of asymmetry hence individualized treatment plan for every patient can result in the best esthetic and functional stability.

Case description: This case study emphasis on an adult patient who has congenital HFM with class I skeletal malocclusion involving asymmetry from the supraorbital level to the lower border of the face. Pre-surgical orthodontics is done initially by aligning the teeth and placing asymmetrical bite block, followed by Lefort I osteotomy with differential impaction (transverse) and bilateral sagittal split osteotomy with rotation along with advancement genioplasty, and finally, post-orthodontics settling done.

Conclusion: A team effort of surgical orthodontists and surgeons with the aid of advanced imaging and software technology made us make an amazing change in patient's life both esthetically and functionally.

Clinical significance: This new innovative method is both a time-saving and conservative method both for patients and dentists.

Keywords: Advancement genioplasty, Bilateral sagittal split osteotomy, Hemifacial microsomia and Lefort I osteotomy.

World Journal of Dentistry (2021): 10.5005/jp-journals-10015-1865

Background

Hemifacial microsomia (HFM) is a congenital complex malformation syndrome with varied nomenclature with a large host of genetic and embryotoxic associations. The occurrence ranges from 1 in 3,500 to 1 in 5,000 live births, with 3:2 male predominance. The exact etiology of HFM is always varying. Pathogenesis involves in disturbed development of first and second branchial arches, which led to underdevelopment of the temporomandibular joint, mandibular ramus, masticatory muscles, ears, and sometimes it affects facial nerves and muscles.[1] A wide spectrum of clinical features was involved like the facial skeleton, muscle, and other organs. Hemifacial microsomia is associated with a deficiency of hard and soft tissues on one side of the face.[2]

Hemifacial microsomia varies from a minor asymmetry to severe under-development of the semi-facial side along with orbital implications. In certain patients, there will be partial or even a total absence of the ear. Chin and facial midline have eccentrically deviated to the affected side. Commonly one corner of the mouth is situated higher than the other side and result in the rise of the oblique lip line. Sometimes, asymmetry is also associated with unilateral hypoplasty of maxillary bones, temporal, zygomatic arch, and malformations of both external and internal parts of the ear.[3]

There are various clinical manifestations for this disorder and many classifications, and the scoring system has been developed to help and categorize these patients. Véliz et al. in 2016 has summarized all the classifications (Fig. 1).[4] One of the classifications that are commonly followed is the classification system of Pruzansky, Pruzansky's classification modified by Kaban and OMENS. The treatment modality has two approaches–the early and late approaches. In the early (growth phase), conventional surgery by an autologous costochondral bone graft or distraction osteogenesis can be done. While in the late (after the active growth phase), conventional Bi-jaw surgery or bimaxillary distraction osteogenesis was advised.[5]

Hemifacial microsomia is always associated with deviation of facial bone and malocclusion of dentition. These two changes

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How to cite this article: Balasubramanian B, Venkatachalapathy S, Natarajan K, *et al.* Facial Asymmetry due to Hemifacial Microsomia Managed by an Interdisciplinary Approach: A Case Report. World J Dent 2021;XX(X):1–6.

Source of support: Nil

Conflict of interest: None

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